

Claims

[c1] 1. A lubrication arrangement for a stage-geared gearbox configured to be arranged in a motor vehicle, said arrangement comprising:
a gearbox (1, 2) having an input shaft (4), an intermediate shaft (5) supported in a casing (15, 16, 21) and having at least one gear meshing with a gear on the input shaft (4);
a main shaft (6) supported in the casing (16, 21) and having gears (7, 8, 9, 10) meshing with gears on the intermediate shaft, at least one gear in each pair of intermeshing gears on the intermediate shaft and the main shaft being rotatably supported on the respective shaft and lockable to that shaft (4, 5, 6) by means of clutch members (12, 13, 14);
at least one gear (11, 18) located on each of the intermediate shaft (5) and the main shaft (6) configured for providing reverse gears;
a reverse gear shaft (20) supported in at least two bearing points (16, 21, 22) in the casing (21, 22), a reverse intermediate gear (19) arranged on the reverse gear shaft (20) between said bearing points (16, 21, 22), the reverse intermediate gear (19) meshing with said two corresponding gears (11, 18) for establishing reverse gears; and
a lubrication device comprising a lubricant pump (24), said lubricant pump (24) being arranged between the said bearing points (16, 21, 22) for the reverse gear shaft (20).

[c2] 2. The lubrication arrangement as recited in claim 1, wherein at least one of the bearing points for the reverse gear shaft (20) is a reverse gear shaft lug (22) that is fixed in the casing (16).

[c3] 3. The lubrication arrangement as recited in claim 1, wherein the reverse intermediate gear (19) is drivingly interconnected with the lubricant pump (24).

- [c4] 4. The lubrication arrangement as recited in claim 1, further comprising:
a suction strainer (46) arranged in a first duct (43, 48) for delivering lubricant to the lubricant pump (24), the first duct and a second duct (47) configured to take lubricant from the lubricant pump (24) and being arranged in the reverse gear shaft lug (22).
- [c5] 5. The lubrication arrangement as recited in claim 1, further comprising:
a pressure limiting valve (29, 30, 31) arranged in the reverse gear shaft lug (22), the pressure limiting valve interconnecting the said first duct (43, 48) and second duct (47) when in an open configuration.
- [c6] 6. The lubrication arrangement as recited in claim 1, further comprising:
a wall of the casing (16) has an opening (23) in connection with the lubricant pump (24) and the reverse intermediate gear (19), the opening (23) being covered by a cover (54), said cover (54) being arranged about a lubricant filter (28) and a third duct (56) for delivering lubricant to the lubricant filter (28) and a fourth duct (58) for taking lubricant from the lubricant filter (28).
- [c7] 7. The lubrication arrangement as recited in claim 1, further comprising:
an overflow valve (59) arranged in the cover (54), the overflow valve (59) connecting said third duct (56) and fourth duct (58) when in an open configuration.
- [c8] 8. The lubrication arrangement as recited in claim 4, wherein the second duct (47) and the third duct (56) are connected to one another and the fourth duct (58) is connected to ducts (53) that carry lubricant to various lubricant consumers in the gearbox (1, 2, 3).
- [c9] 9. The lubrication arrangement as recited in claim 1, wherein that the gearbox (1, 2) comprises a range transmission (3) coupled to the main shaft (6).